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Case report

The air-fluidised bed in the management of chronic varicose leg ulceration

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Air-fluidised bed therapy has been used for the prevention and treatment of bedsores. We report the successful use of this form of treatment for severe chronic varicose leg ulcers.

CASE REPORT. A 68-year-old woman presented to the geriatric medical unit with severe chronic varicose ulceration of the lower limbs. This had been present for over twenty years and had resulted in her spending two out of the past three years in hospital. She had been discharged from a dermatology unit less than three months earlier. Her ulcers were associated with marked oedema of the legs. She was grossly obese (weight 110 kgs) and had non-insulin-requiring diabetes mellitus. She lived in a sheltered dwelling with maximum home help support. A district nurse was dressing her legs twice daily. Although able to walk slowly with a Zimmer walking aid, she was reluctant to do so. She refused to elevate her legs and often slept in her chair. She also had been depressed and had exhibited antisocial behaviour.

Fungating ulceration and purulent discharge from the affected lesions were present at the time of her admission. There were three large purulent ulcers on the left leg, two of 5 × 5 cms and one of 14 × 8 cms. There was a 14 × 7 cms necrotic ulcer on the right leg. Maggots of the common house-fly were observed in the ulcer. Several toes were pre-gangrenous. She was in considerable pain and required slow-release morphine sulphate. Her sleep pattern was poor and she was demanding and unco-operative at times. Amputation was considered but was rejected by the patient.

Because of the severity of the ulceration and difficulties in nursing, therapy on an air-fluidised bed was commenced. A low calorie diet and daily wound dressing were instituted.

After eight days on the air-fluidised bed the oedema had greatly improved. The ulcers were cleaner and were beginning to heal and pain was less. Progress was maintained and after three weeks a similar but lower bed was used from which the patient could more easily be mobilised for physiotherapy. The air-fluidised bed was used for five weeks. At the end of this period two small ulcers (one of which

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measured 3 cms × 2 cms) remained on the left leg and another 3 cms × 2 cms ulcer remained on the right.

In spite of having been chair or bedfast for several weeks, the patient mobilised well. She was discharged to her sheltered dwelling two months after admission. Her weight fell to 93 kgs, her mood improved and she required only paracetamol for pain relief.

DISCUSSION

Air-fluidised bed therapy employes air bubbled through soda lime crystals coated with silicone. These microspheres look like a fine white powder. They act like a liquid and reduce pressure on the skin in contact with the bed to 11 mmHg (capillary closing pressure is 30 mmHg). This gives one of the lowest pressures of the methods available.[1,2] The pH of 9 impedes bacterial growth.[3] It has been used to nurse patients with burns and pressure sores,[1] but its use in severe varicose leg ulceration has not been described.

The bed can have a dehydrating effect by increasing insensible water loss. This may cause volume depletion[4] which was beneficial in this patient's case as a considerable amount of her 17 kgs weight loss was achieved by an early reduction in leg oedema. However, this dehydrating effect can cause hypernatraemia which can be a serious problem in critically ill patients in whom fluid balance must be carefully monitored.[5]

The cost-effectiveness of such treatment is important. These beds are available only for hire at a cost of approximately £60 per day, including full 24-hour technical back-up. Before this patient commenced fluidised bed therapy, daily dressings were costing about £35 whereas none was subsequently needed. This patient had spent about two years in hospital at a cost of over £40,000 with marginal benefit to her leg ulcers. Community care involving daily dressings by a district nurse was also expensive. Factors such as the reduction in pain and depression are also important but are difficult to quantify.

Increased venous return, reduction in oedema and the bactericidal effect of the reduced pH may all have contributed to the improvement in this patient. Short term therapy with an air-fluidised bed may be clinically helpful and cost-effective in patients with severe refractory varicose leg ulceration when marked chronic oedema is present.

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